

Important Questions 2010
Class-XII- Maths
Permutations & Combinations

Q.1. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, Find x

Q.2. Find the value of n such that $\frac{{}^n P_4}{{}^{n-1} P_4} = \frac{5}{3}$, $n > 4$

Q.3. Find r, if $5.4Pr = 6.5Pr-1$

Q.4. Determine n if : $2nC3 : nC3 = 11 : 1$

Q. 5. In how many ways can 4 red, 3 yellow and 2 green discs can be arranged in a row if the discs of the same colour are indistinguishable.

Q.6. Given 5 flags of different colours, how many different signals can be generated if each signal requires the use of two flags, one below the other?

Q.7. How many 4 –digit numbers are there with no digits repeated.

Q.8. How many three-digit numbers can be formed without using the digits 0,2,3,4,5 and 6?

Q.9. How many numbers are there between 100 and 1000 in which all the digits are distinct?

Q.10. How many numbers are their between 100 and 1000 such that 7 is in the unit's place.

Q.11. How many numbers greater than 1000, but not greater than 4000 can be formed with the digits 0,1,2,3,4 if: (i) repetition of digits is allowed?
(ii) repetition of digits is not allowed?

Q.12. How many three digit odd numbers can be formed by using the digits 1,2,3,4,5,6 if:
(i) the repetition of digits is not allowed?
(ii) the repetition of digits is allowed?

Q.13. How many four-digit numbers can be formed with the digits 3,5,7,8,9 which are greater than 7000, if repetition of digits is not allowed?

Q.14. How many numbers greater than 1000000 can be formed by using the digits 1,2,0,2,4,2,4?

Q.15. How many odd numbers less than 1000 can be formed by using the digits 0,3,5,7 when repetition of digits is not allowed?

Q.16. How many different numbers of six digits can be formed from the digits 3,1,7,0,9,5 when repetition of digits is not allowed?

Q.17. How many four digit different numbers, greater than 5000 can be formed with the digits 1, 2, 5, 9, 0 when repetition of digits is not allowed?

Q.18.. How many 6-digit telephone numbers can be constructed with digits 0,1,2,3,4,5,6,7,8,9 if each number starts with 35 and no digit appears more than once?

Q.19. In how many ways 5 girls and 3 boys be selected in a row so that no two boys are together.

Q.20. A committee of 7 has to be formed from 9 boys and 4 girls. In how many ways can this be done

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when the committee consists of at least 3 girls.

Q.21. Find the number of words with or without meaning which can be made using all the letters of the word AGAIN. If these words are written as in dictionary, what will be the 50th word?

Q.22. In how many ways can the letters of the word PERMUTATIONS be arranged if the

1. words start with P and end with S,
2. vowels are all together,
3. there are always 4 letters between P and S.

Q.23. Find the number of different 4-letter words, with or without meanings, that can be formed from the letters of the word 'DELHI', Using each letter exactly once?

Q.24. How many words can be formed from the letters of the word 'DAUGHTER' so that
(i) the vowels always come together? (ii) the vowels never come together?

Q.25. A letter lock consists of three rings each marked with 10 different letters. In how many ways it is possible to make an unsuccessful attempt to open the lock?

Q.26. From among the 36 teachers in a school, one principal and one vice-principal are to be appointed. In how many ways can this be done?

Q.27. In how many ways can 3 prizes be distributed among 4 boys, when

- (i) no boy gets more than one prize?
- (ii) a boy may get any number of prizes?
- (iii) no boy gets all the prizes?

Q.28. Find the number of ways in which 5 boys and 5 girls be seated in a row so that

- (i) No two girls may sit together.
- (ii) All the girls sit together and all the boys sit together.
- (iii) All the girls are never together.

Q.29. How many different words can be formed from the letters of the word 'GANESHPURI'? In how many of these words:

- (i) the letter G always occupies the first place?
- (ii) the letters P and I respectively occupy first and last place?
- (iii) the vowels are always together?
- (iv) the vowels always occupy even places?

Q.30. How many words (with or without dictionary meaning) can be made from the letters in the word MONDAY, assuming that no letter is repeated, if

- (i) 4 letters are used at a time?
- (ii) all letters are used at a time.
- (iii) all letters are used but first is vowel.

Q.31. If the letters of the word 'MOTHER' are written in all possible orders and these words are written out as in a dictionary, find the rank of the word 'MOTHER'.

Q.32. In how many ways can the letters of the word 'ARRANGE' be arranged so that the two R's are never together?

Q.33. The letters of the word 'ZENITH' are written in all possible orders. How many words are possible if all these words are written out as in a dictionary? What is the rank of the word 'ZENITH'?

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Q.34. How many different arrangements can be made by using all the letters in the word 'MATHEMATICS'. How many of them begin with C? How many of them begin with T?

Q.35. There are 10 professors and 20 students out of whom a committee of 2 professors and 3 students is to be formed. Find the number of ways in which this can be done. Further find in how many of these committees:

- (i) a particular professor is included.
- (ii) a particular student is included.
- (iii) a particular student is excluded.

Q.36. A student has to answer 10 questions, choosing at least 4 from each of part A and part B. If there are 6 questions in part A and 7 in part B, in how many ways can the student choose 10 questions?

Q.37. A candidate is required to answer 7 questions out of 12 questions which are divided into two groups, each containing 6 questions. He is not permitted to attempt more than 5 questions from either group. In how many ways can he choose the 7 questions?

Q.38. In an examination, a question paper consists of 12 questions divided into two parts i.e., Part I and Part II, containing 5 and 7 questions, respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions ?

Q.39. In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?

Q.40. In how many ways can 3 prizes be distributed among 4 boys, when

- (i) no boy gets more than one prize?
- (ii) a boy may get any number of prizes?
- (iii) no boy gets all the prizes?

Q.41. Out of 18 points in a plane, no three are in the same straight line except five points which are collinear. How many (i) straight lines (ii) triangles can be formed by joining them?

Q.42. In how many ways can a student choose a programme of 5 courses if 9 courses are available and 2 specific courses are compulsory for every student?

Q.43. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these:

- (i) four cards are of the same suit,
- (ii) four cards belong to four different suits,
- (iii) are face cards,
- (iv) two are red cards and two are black cards,
- (v) cards are of the same colour?